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NG, CHRISTINE Y	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/786,604	RITTER, GERHARD	
	Examiner	Art Unit	
	Christine Ng	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 15-25 and 26-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 15 and 26: It is unclear what is meant by the "...substantially constant power level..." (line 9) and "...substantially the same..." (line 10). This is unclear because "substantially" is a relative term. The power levels are either constant or fluctuating, so it is unclear how they can be "substantially constant", and to what degree they are "substantially constant". Also, the power levels for all base stations are either the same or different, so it is unclear how they can be "substantially the same", and to what degree they are "substantially the same".

In claim 23: It is unclear what is meant by "...substantially identical..." (line 2). This is unclear because "substantially" is a relative term. The channel measurement sequences are either the same or different, so it is unclear how they can be "substantially identical", and to what degree they are "substantially identical".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 15, 16, 18, 26, 27 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,125,125 to Narasimha et al in view of U.S. Patent No. 5,983,101 to Billstrom.

Referring to claims 15 and 26, Narasimha et al disclose in Figure 1 a method of measuring transmission characteristics of a radio channel in a radio communications system comprised of base stations (BTS 14) and a radio station (mobile units 16), wherein communications are transmitted over the radio communications system in time frames, each of the time frames comprising time slots. Refer to Column 2, lines 33-67. The method comprises:

Each of the base stations transmitting bursts in a time slot, each of the bursts comprising a channel measurement sequence (training sequence) for use in obtaining characteristics of a transmission channel in which a corresponding burst is transmitted. BTS 14 transmits a training sequence in every time slot so that the mobile can learn the characteristics of the intervening radio path. Refer to Column 1, lines 37-42 and Column 3, lines 5-8.

Narasimha et al do not disclose wherein the channel measurement sequences are transmitted by the base stations at a substantially constant power level, wherein the substantially constant power level at which the channel measurement sequences are transmitted is substantially the same for all of the base stations.

Billstrom disclose in Figure 4A a method in which a base station selects (400) a transmit power density that is constant for all bitrates and modulation types. A C/I ratio

is then calculated (408) to determine if it is greater than the minimum C/I for each terminal (410) and a corresponding modulation type is chosen. A change from one modulation type to another will not affect the C/I calculations since all modulation types are transmitted with the same power density. Refer to Column 5, line 57 to Column 7, line 11; and Column 8, lines 64-67. Furthermore, Narasimha et al disclose in Figure 2B that all of the BTS's must be synchronized so that the training sequences will be received by the mobile stations at the same time to facilitate handoff. The training sequences from all BTS's thus should also be transmitted with substantially the same power level, so that the mobile stations can receive all of the training sequences equally, which also facilitates handoff. Refer to Column 4, line 58 to Column 5, line 13. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the channel measurement sequences are transmitted by the base stations at a substantially constant power level, wherein the substantially constant power level at which the channel measurement sequences are transmitted is substantially the same for all of the base stations. One would be motivated to do so in order to maintain the same C/I characteristics even when the base stations change transmission properties, such as modulation type, and in order to facilitate handoff.

Referring to claims 16 and 27, Narasimha et al disclose in Figure 2A wherein the bursts (20a and 22b) comprise data blocks in addition to the channel measurement sequences (24a and 24b). A training sequence is transmitted in the middle of every time slot. Refer to Column 1, lines 37-42 and Column 3, lines 5-32.

Referring to claims 18 and 33, Narasimha et al disclose in Figure 2B wherein the base stations are synchronized prior to transmitting the burst. All base stations synchronize according to a GPS mechanism before transmitting frames to mobile stations, so that the training sequences will be received by the mobile stations at the same time. Refer to Column 3, lines 5-49 and Column 4, line 58 to Column 5, line 5.

Referring to claim 31, Narasimha et al disclose in Figure 2B wherein each of the base stations is configured to transmit the bursts comprises channel measurement sequences (24a and 24b) at substantially a same time. All base stations use a synchronizing GPS mechanism to transmit frames to mobile stations at the same time so that the training sequences will be received by the mobile stations at the same time. Refer to Column 3, lines 5-49 and Column 4, line 58 to Column 5, line 5.

Referring to claim 32, Narasimha et al disclose in Figure 2A wherein at least one channel measurement sequence (24a and 24b) is transmitted in a middle of a corresponding burst. A training sequence is transmitted in the middle of every time slot. Refer to Column 3, lines 5-8.

5. Claims 17 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,125,125 to Narasimha et al in view of U.S. Patent No. 5,983,101 to Billstrom, and in further view of U.S. Patent No. 6,141,373 to Scott.

Narasimha et al do not disclose wherein a data block of a burst is transmitted at a power level that is different from a power level at which a channel measurement sequence of the burst is transmitted.

Scott discloses that a preamble that is used for synchronization can be transmitted at a higher power than the transmit power of the data. This increases the likelihood that the preamble will be detected. Refer to Column 1, line 55 to Column 2, line 60. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein a data block of a burst is transmitted at a power level that is different from a power level at which a channel measurement sequence of the burst is transmitted. One would have been motivated to do so in order to allow the training sequence to be transmitted at a higher power level than the data to allow easier preamble detection.

6. Claims 19-21 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,125,125 to Narasimha et al in view of U.S. Patent No. 5,983,101 to Billstrom, and in further view of U.S. Patent No. 5,274,669 to Klank et al.

Referring to claims 19 and 34, Narasimha et al do not disclose wherein the radio station uses cyclic correlation for channel measurement.

Klank et al disclose in Figure 3 a method of using cyclic correlation to determine the channel pulse response. Refer to Column 1, lines 56-65; Column 3, line 57 to Column 4, line 14; and Column 5, lines 11-14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the radio station uses cyclic correlation for channel measurement. One would be motivated to do so so that the same basic training sequence can be utilized to determine channel measurements, thereby simplifying the system.

Referring to claim 20, Narasimha et al disclose wherein each base station transmits a same channel measurement sequence. Narasimha et al disclose that "preferably, the training sequence transmitted from one BTS 14 is different than the training sequence transmitted by the other BTS's 14 that can cause co-channel interference" (Column 3, lines 9-11). This implies that BTS's that will not be subject to co-channel interference can have the same training sequence.

Referring to claim 21, Narasimha et al disclose wherein different base stations transmit channel measurement sequences with different code phases. The "training sequences are orthogonal and will not interfere with each other if received at a mobile unit at precisely the same time" (Column 3, lines 12-14).

7. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,125,125 to Narasimha et al in view of U.S. Patent No. 5,983,101 to Billstrom, and in further view of U.S. Patent No. 5,583,870 to Delprat et al.

Narasimha et al do not disclose wherein a channel measurement sequence in a predetermined time slot includes an identifier.

Delprat et al disclose transmitting a channel measurement sequence (training sequence) and using an identifier (rank 0) for the channel measurement sequence in a predetermined timeslot (Figure 1B, time slot IT0) in the time frame. Timeslot IT0 contains a synchronization sequence, identified by a rank of 0. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein a channel measurement sequence in a predetermined time slot includes an identifier. One would have been motivated to do so in order to comply with

conventional GSM standards. Refer to Column 1, lines 39-49; Column 4, lines 61-63; and Column 5, lines 55-60.

8. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,125,125 to Narasimha et al in view of U.S. Patent No. 5,983,101 to Billstrom in view of U.S. Patent No. 5,583,870 to Delprat et al, and in further view of U.S. Patent No. 4,577,334 to Boer et al.

Referring to claims 23 and 24, Narasimha et al do not disclose wherein the channel measurement sequence in the predetermined time slot is substantially identical to the channel measurement sequences in other time slots in a corresponding time frame.

Delprat et al disclose that the channel measurement sequence (training sequence) in the predetermined time slot (Figure 1B, time slot IT0) is substantially identical to channel measurement sequences in other time slots in the time frame (Figure 1B, time slots IT1-IT7). Refer to Column 5, lines 55-60. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the channel measurement sequence in the predetermined time slot is substantially identical to the channel measurement sequences in other time slots in a corresponding time frame. One would have been motivated to do so in order to simplify the system by using the same channel measurement sequences in all time slots.

Narasimha et al also do not disclose phase modulating the channel measurement sequence in the predetermined time slot [claim 23] and phase modulating

the channel measurement sequence in the predetermined timeslot 180° between two time frames [claim 24].

Boer et al disclose in Figure 1 that the first part of a signal received over line 1 is a receiver training sequence that is phase modulated with two alternating phases modulated at a rate f_b on the carrier frequency f_c. Refer to Column 3, lines 35-39. As shown in Figure 2B, the phase alternations can be formed by 180° phase jumps. Refer to Column 3, lines 59-62. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include phase modulating the channel measurement sequence in the predetermined time slot [claim 23] and phase modulating the channel measurement sequence in the predetermined timeslot 180° between two time frames [claim 24]. One would be motivated to do so since phase modulation is a common form of modulation to carry signals across a channel, allowing the use of a single carrier frequency in which the signal is encoded into the phase changes of the carrier. An 180° phase modulation offers the advantage of only having to detect two phase changes at the receiver in order to recover the original signal, thereby minimizing error.

9. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,125,125 to Narasimha et al in view of U.S. Patent No. 5,983,101 to Billstrom, and in further view of U.S. Patent No. 5,598,404 to Hayashi et al.

Referring to claim 29, Narasimha et al do not disclose that the radio communication system comprises a TDD communication system.

Hayashi et al disclose that in a TDD system, the transmission/reception is performed in the same frequency band on the basis of time division. Refer to Column 2, lines 62-65. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the radio communication system comprises a TDD communication system. One would be motivated to do so since as compared with FDD, TDD offers more efficient use of the spectrum and bandwidth since each user is allocated only one channel and is comparatively more flexible, less complex and cheaper.

Referring to claim 30, Narasimha et al do not disclose that the radio communication system comprises a FDD communication system.

Hayashi et al disclose that in a FDD system, two frequency bands, which are sufficiently spaced apart from each other, are respectively assigned to transmission and reception. Refer to Column 2, line 65 to Column 3, line 2. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the radio communication system comprises a FDD communication system. One would be motivated to so do since as compared with TDD, FDD does not introduce latency between the transmit and receive cycles, allows transmission and reception at the same time, and avoids propagation delays that limit the distance between the user and the station.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (571) 272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C. Ng
December 14, 2007

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